

Serial No. 10/099,838

Page 2 of 12

IN THE CLAIMS

1. (currently amended) A data distribution system comprising:

a data distribution server for supplying data to a user side;

at least one access server provided on the user side and transferring intended data to each user; and

a network cache apparatus provided in a network wherein said data is distributed between said data distribution server and said access server, said network cache apparatus having a cache function unit for temporarily storing said data from said data distribution server and an exchange function unit for routing the stored data to said access server corresponding to a destination user, said cache function unit storing said data for a valid term based on a distribution valid term transferred from said distribution server, simultaneously with said data, the stored data being transmitted to said access server after confirming that a reception buffer of said access server is not in a congestion state, wherein

both said data distribution server and network cache apparatus and both said network cache apparatus and access server are connected via an optical cross-connect equipment forming said exchange function unit of the network cache apparatus and said data is distributed by wavelength multiplex transmission,

said data distribution server is provided with a first congestion monitor indicating unit for transmitting a first inquiry request command to the network cache apparatus and inquiring about the congestion state thereof when said data must be transmitted to said network cache apparatus,

said network cache apparatus is provided with a first congestion monitor responding unit for receiving said first inquiry request command, inquiring about the congestion state thereof, and returning the result to said congestion monitor indicating unit as a first inquiry response, and

84218991_1

Serial No. 10/099,838

Page 3 of 12

said data distribution server transmits said data when said first inquiry response indicates "no congestion".

2. - 3. (canceled)

4. (original) A data distribution system as set forth in claim 1, wherein, where there is only one network cache apparatus in said network,

said data distribution server is provided with a data transmitting unit for generating a packet for transmitting said data and adding a cache specifying address for specifying said network cache apparatus as a destination of transmission to the packet, and

said network cache apparatus is provided with a routing unit for adding a distribution address for setting said access server to which said packet is to be distributed from the destination information contained in said packet to the packet when detecting said cache specifying address directed to itself and transmitting this to said access server side and thereby performs the distribution of said data.

5. (original) A data distribution system as set forth in claim 1, wherein, where there are a plurality of said network cache apparatuses inside said network,

said data distribution server is provided with a data transmitting unit for generating the packet for transmitting said data and adding a cache-specifying multi-cast address for specifying a plurality of said network cache apparatuses as the destination of transmission to the packet, and

each said network cache apparatus further distributes said packet to said network cache apparatus of the next stage based on the cache-specifying multi-address when detecting said

84218991_1

Serial No. 10/099,838

Page 4 of 12

cache-specifying multi-address containing the address of itself and each network cache apparatus is provided with a routing unit for adding a distribution address for setting said access server to which said packet is to be distributed from the destination information contained in said packet to the packet and transmitting this to said access server side and thereby performs the distribution of said data.

6. (canceled)

7. (original) A data distribution system as set forth in claim 1, wherein said network cache apparatus is provided with a second congestion monitor indicating unit for transmitting a second inquiry request command to the access server and inquiring about the congestion state thereof when said data is received from said data distribution server and the data must be transmitted to said access server,

said access server is provided with a second congestion monitor responding unit for receiving said second inquiry request command, inquiring about the congestion state thereof, and returning the result as a second inquiry response to said second congestion monitor indicating unit, and

said network cache apparatus transmits said data when said second inquiry response indicates "no congestion".

8. (currently amended) A data distribution server placed on an outside of a network,

84218991_1

Serial No. 10/099,838

Page 5 of 12

receiving data from the outside, temporarily holding this, communicating with a network cache apparatus provided in said network for routing the held data to a user side, and distributing said data to a user outside said network,

wherein a valid term of the distribution is sent to said network cache apparatus together simultaneously with said data, and said data is transmitted to said cache apparatus after confirming that a reception buffer of said cache apparatus is not in a congestion state, and

wherein both said data distribution server and network cache apparatus and both said network cache apparatus and user side are connected via an optical cross-connect, and said data is distributed by wavelength multiplex transmission,

wherein a congestion monitor indicating unit for outputting a send instruction is provided, and the congestion monitor indicating unit transmits an inquiry request command with respect to the network cache apparatus to inquire about the congestion state thereof when said data and information are to be transmitted to said network cache apparatus,

wherein said data distribution server is provided with a first congestion monitor indicating unit for transmitting a first inquiry request command to the network cache apparatus and inquiring about the congestion state thereof when said data must be transmitted to said network cache apparatus,

wherein said network cache apparatus is provided with a first congestion monitor responding unit for receiving said first inquiry request command, inquiring about the congestion state thereof, and returning the result to said congestion monitor indicating unit as a first inquiry response, and

wherein said data distribution server transmits said data when said first inquiry response indicates "no congestion".

84218991_1

Serial No. 10/099,838
Page 6 of 12

9. (original) A data distribution server as set forth in claim 8, wherein provision is made of a data transmitting unit for generating a packet for transmitting said data and adding a cache-specifying address for specifying said network cache apparatus as the destination of transmission to the packet and adding a cache-specifying multi-cast address for specifying a plurality of said network cache apparatuses as the destination of transmission to the packet where there are a plurality of said network cache apparatuses in said network.

10. (previously presented) A data distribution server as set forth in claim 9, wherein said data transmitting unit is linked with a data access request receiving unit for accepting a send request of said data from a data provider or an access request of said data from the user and outputs information concerning at least a destination list of the destination of distribution of said data and the valid term of the distribution together with the related data from the data access request receiving unit.

11. (previously presented) A data distribution server as set forth in claim 9, wherein provision is further made of a data storage unit for storing said data and information output from said data access request receiving unit for the valid term and said stored data and information are transmitted from said data transmitting unit to said network cache apparatus according to a send instruction.

12. (canceled)

W4218991_1

Serial No. 10/099,838

Page 7 of 12

13. (currently amended) A network cache apparatus comprising:

a cache function unit linked with both a data distribution server for supplying data to a user side and at least one access server provided on the user side and transferring intended data to users, said cache function unit temporarily storing said data from said data distribution server; and

an exchange function unit for routing the stored data to said access server corresponding to a destination user, said cache function unit storing said data for a valid term based on a distribution valid term transferred from said distribution server simultaneously with said data, the stored data being transmitted to said access server after confirming that a reception buffer of said access server is not in a congestion state,

wherein both said data distribution server and network cache apparatus and both said network cache apparatus and access server are connected via an optical cross-connect equipment forming said exchange function unit of the network cache apparatus and said data is distributed by wavelength multiplex transmission,

wherein said cache function unit has a congestion monitor responding unit for performing an inquiry in response to an inquiry request of the congestion state from said data distribution server and returning the result to the data distribution server,

wherein said data distribution server is provided with a first congestion monitor indicating unit for transmitting a first inquiry request command to the network cache apparatus and inquiring about the congestion state thereof when said data must be transmitted to said network cache apparatus,

wherein said network cache apparatus is provided with a first congestion monitor responding unit for receiving said first inquiry request command, inquiring about the congestion

84218991_1

Serial No. 10/099,838

Page 8 of 12

state thereof, and returning the result to said congestion monitor indicating unit as a first inquiry response, and

wherein said data distribution server transmits said data when said first inquiry response indicates "no congestion".

14. (canceled)

15. (previously presented) A network cache apparatus as set forth in claim 13, wherein said cache function unit has

a routing unit for receiving said data and information concerned with at least a distribution destination list of the data and the distribution valid term thereof from said data distribution server and controlling a distribution of the data to said access server corresponding to the user as the destination of the distribution via said exchange function unit and a data storage unit for storing the data from said routing unit for the valid term.

16. (original) A network cache apparatus as set forth in claim 15, wherein said routing unit creates a routing table listing a group of addresses of the distribution destinations based on said information and specifies said user as the destination of the distribution according to the routing table.

17. (original) A network cache apparatus as set forth in claim 15, wherein said cache function unit has a congestion monitor indicating unit, and the congestion monitor indicating unit

84218991_1

Serial No. 10/099,838

Page 9 of 12

transmits an inquiry request command to the access server when said data is to be transmitted to said access server and confirms whether or not the inquiry response indicates "no congestion".

18. (original) A network cache apparatus as set forth in claim 17, wherein said cache function unit has a data transmitting unit, and the data transmitting unit transfers said data stored in said data storage unit toward said exchange function unit when said inquiry response indicates "no congestion".

19. (original) A network cache apparatus as set forth in claim 18, wherein said routing unit creates the routing table listing the group of addresses of the destinations of the distribution based on said information and specifies said user as the distribution destination according to the routing table, said cache function unit has a data distributing unit, and the data distributing unit transfers the data from said data transmitting unit to said exchange function unit toward said user as the destination of the distribution specified according to said routing table.

20. (original) A network cache apparatus as set forth in claim 19, wherein said cache function unit has a path setting request unit, and the path setting request unit performs the route setting toward said user as the destination of distribution specified according to said routing table with respect to said exchange function unit.

84218991_1

Serial No. 10/099,838

Page 10 of 12

21. (original) A network cache apparatus as set forth in claim 20, wherein said path setting request unit selectively performs said route setting with respect to the access server for which said inquiry response indicates "no congestion" among a plurality of said access servers and prohibits the transfer of said data to be distributed to the access server from said data distributing unit with respect to an access server for which said inquiry response does not indicate "no congestion".

22. – 26. (canceled)

27. (original) A data distribution system as set forth in claim 1, giving said cache function unit a duplex configuration, having each of an active cache function unit and a standby cache function unit constantly execute transfer of a monitor packet with said exchange function unit, and, when finding an abnormality in said active cache function unit monitored by the monitor packet, switching to said standby cache function unit to continue the distribution of said data.

28. (original) A data distribution system as set forth in claim 1, wherein, when there are three or more network cache apparatuses inside said network, all network cache apparatuses are made able to set two or more transmission lines connected to two or more other network cache apparatuses, a failure monitor means for monitoring for failure of a transmission line is provided in said exchange function unit in each said network cache apparatus, and, when detecting the occurrence of said failure by the failure monitor means, the related failure transmission line is switched to another transmission line and the distribution of said data is continued.

84218991_1